

IN THE SPECIFICATION

*Please replace the title of this application with the following title:*

--AUDIO CHARACTERISTIC CORRECTION SYSTEM--

*On Page 1, following the Title and before the Technical Field section, please insert the following:*

--This application is a U. S. National Phase Application of PCT International Application PCT/JP2004/014443 filed on September 24, 2004.--

*On Pages 3 - 4, please delete the paragraph spanning these pages and insert the following replacement paragraph:*

--This invention provides an audio characteristic correction system adapted to an audio surround system in which sounds emitted from directional speakers each having sharp directivity are reflected on wall surfaces of a prescribed room or on sound reflection boards so as to produce virtual speakers, wherein audio characteristics of the wall surfaces or sound reflection boards are corrected for. It has a characteristic correction means for correcting at least one of ~~frequencies, gain~~ frequency-gain characteristics, frequency-phase characteristics, and gains of audio signals supplied to the aforementioned directional speakers in such a way that sounds reflected on the aforementioned wall surfaces or sound reflection boards have desired audio characteristics at a prescribed listening position. A sound emission device such as an array speaker or a parametric speaker realizing intense directivity is arranged at a prescribed position; sound waves output therefrom (i.e., sounds) are emitted to and reflected on a prescribed wall surface or a sound reflection board; thus, it is possible to realize sound localization in which a speaker may actually exist at a reflection position. Herein, the problem is audio characteristics of the wall surface or sound reflection board, which should be corrected for. This invention does not involve processing or modifying the wall or sound reflection board but correcting audio signals corresponding to sounds emitted from directional speakers, and thus imparting ideal audio characteristics (e.g., flat audio characteristics) to sounds reaching a listening position or imparting audio characteristics preferred by a listener.--

*On Page 4, please delete the first full paragraph and insert the following replacement paragraph:*

--In accordance with one embodiment, an audio characteristic correction system of this invention is constituted to include a measurement means for measuring audio characteristics of sounds reflected on the aforementioned wall surface or sound reflection board, and a control means for controlling at least one of ~~frequencies, gain~~ frequency-gain characteristics, frequency-phase characteristics, and gains of the aforementioned characteristic correction means based on measurement results in such a way that sounds reflected on the wall surface or sound reflection board have desired audio characteristics at a listening position.--

*On Pages 4 - 5, please delete the paragraph spanning these pages and insert the following replacement paragraph:*

--In accordance with this invention, which has a measurement means for measuring audio characteristics of sounds reflected on the wall surface or sound reflection board and a control means for controlling at least one of ~~frequencies, gain~~ frequency-gain characteristics, frequency-phase characteristics, and gains of the characteristic correction means based on measurement results in such a way that sounds reflected on the wall surface or sound reflection board have desired audio characteristics at a listening position, it is possible to cope with differences of audio characteristics due to wall surfaces (or rooms). By measuring audio characteristics of sounds reflected on the wall surface or sound reflection board, it is possible to make a decision as to whether or not desired audio characteristics can be obtained; hence, it is possible to notify the listener of an even in which desired audio characteristics cannot be obtained in spite of the characteristic correction means performing correction.--

*On Page 9, please delete the first full paragraph and insert the following replacement paragraph:*

--Next, operations for correcting frequency-gain characteristics at the wall surface or the sound reflection board 4 will be described with reference to FIGS. 3A to 3G. The present embodiment is designed upon the presumption that ideal sound transmission characteristics are established in the space of a room for the purpose of avoiding ~~complicity~~ complicacy in realization of a sound system model.--

*On Pages 14 - 15, please delete the paragraph spanning these pages and insert the following replacement paragraph:*

--Next, a third embodiment of this invention will be described. FIG. 8 is a block diagram showing an audio characteristic correction system in accordance with the third embodiment,

wherein parts identical to those of the first embodiment shown in FIG. 1 are designated by the same reference numerals. The audio characteristic correction system of the third embodiment includes an audio signal generation ~~circuit~~ device 1, a characteristic correction device 2, a directional speaker 3, a microphone 5, a characteristic analysis device 6 for analyzing audio characteristics of sounds picked up by the microphone 5, a characteristic correction control device 7 for controlling at least one of frequency-gain characteristics, frequency-phase characteristics, and gain of the characteristic correction device 2 based on the analysis results of the characteristic analysis device 6 such that a sound S2 reflected on the wall surface or the sound reflection board 4 has desired audio characteristics at a listening position, and a main speaker 8 for outputting an audio signal of a main channel (i.e., a main left signal L or a main right signal R). The aforementioned microphone 5 and characteristic analysis device 6 form a measurement means, and the characteristic correction control device 7 forms a control means.--

*On Pages 15 - 16, please delete the paragraph spanning these pages and insert the following replacement paragraph:*

--Next, operation for measuring the frequency-gain characteristics and frequency-phase characteristics of the sound S2 reflected on the wall surface or the sound reflection board 4 and operation for controlling the frequency-gain characteristics and frequency-phase characteristics of the characteristic correction device 2 based on measurement results will be described. Herein, the audio signal generation device 1 generates band noise having a certain frequency band as the audio signal S0 for measurement. In this case, the characteristic correction device 2 is put into a through state (where  $S0=S0'$ ), and the main speaker 8 is put into an OFF state (i.e., a silent state). The band noise output from the audio signal generation ~~circuit~~ device 1 is emitted as the sound S1 towards the wall surface or the sound reflection board 4 by means of the directional speaker 3, whereby it is reflected and then reaches the microphone 5 arranged at the listening position as the sound S2.--

*On Page 22, please delete the first full paragraph and insert the following replacement paragraph:*

--Thereafter, the characteristic correction control device 7a selects optimum characteristics from among characteristics of the stored sounds S2 so as to select the corresponding directivity control coefficients, which in turn correspond to positions (i.e., focal positions) on the wall surface or the sound reflection board 4 and are set up as representations of positions of virtual speakers.--

*On Pages 24 - 25, please delete the paragraph spanning these pages and insert the following replacement paragraph:*

--The audio signal generation device 1 outputs the audio signal S0 for measurement to the delay correction device 10 in response to the trigger signal output from the characteristic analysis device 6b. At this time, the delay time of the delay correction device 10 is set to a minimum value. The audio signal S0 for measurement is supplied to the main speaker 8 via the delay correction device 10, so that a sound S3 is emitted towards the microphone 5. Thus, the characteristic ~~correction~~ analysis device 6b measures an arrival time at which the microphone 5 detects the sound S3 after generation of the trigger signal. Next, the characteristic analysis device 6b detects a time difference between the arrival times of the sounds S2 and S3 as an absolute delay time. Instead, the audio signal generation device 1 may supply an impulse signal simultaneously to the characteristic correction device 2 and the delay correction device 10; then, a time difference be detected between the arrival times of the sounds S2 and S3 reaching the microphone 5 based on the impulse signal, thus measuring an absolute delay time.--